

**[CLAIMS]****[Claim 1]**

A wind turbine for producing electricity using wind, the wind turbine including a steel tower which is placed on the ground and formed by fastening a plurality of steel pieces in longitudinal and transverse directions, a support plate which is mounted to the steel tower, power generating means which is installed on the support plate and has a plurality of sail structures, an auxiliary sprocket which is placed on the support plate, is connected to a driving shaft of the power generating means by a power transmitting chain and is rotated by power generated by the power generating means, and a rotation shaft which is connected to the auxiliary sprocket by a driving chain to transmit power to a generator,

wherein, in the power generating means, the driving shaft(103), a plurality of columns(105), and a guide shaft(104) are sequentially installed between a base frame(101) which is fastened to the support plate(700) via a plurality of support rods(106) and a cover frame(102) which is positioned above the base frame(101) in such a way as to connect the base frame(101) and the cover frame(102) to each other; a plurality of guide rails(110), which are regularly spaced apart from one another in a vertical direction, are fastened to the columns(105) to define closed loops which surround the driving shaft(103), guide

shaft(104) and columns(105); and the plurality of sail structures(200) each of which can be adjusted in its wind pressure acting area by means of a geared motor(250) and a coil spring(260) are connected to sprocket chains(120) which are provided in the guide rails(110) such that the sail structures(200) can be moved along the guide rails(110) by wind force to rotate the sprocket chains(120) and sprockets(103') of the driving shaft(103) which are meshed with the sprocket chains(120), and

wherein two power generating means(100, 100') are installed such that they have a predetermined slope and symmetrical structures with respect to a transverse center line(S1) of the support plate(700), to transmit power generated by the driving shaft(103) to the auxiliary sprocket(720) through power transmitting chains(730, 740).

#### 【Claim 2】

The wind turbine according to claim 1, wherein the sail structure(200) comprises a frame(210) having a plurality of transverse pipes(211, 212, 213) each of which is hingedly coupled to the sprocket chain(120) at one end thereof and a plurality of longitudinal pipes(214) which connect the transverse pipes with one another in the vertical direction; shaft fastening brackets(215) and connection shaft fastening brackets(216) installed at both ends of the transverse pipes(211, 212) which are positioned

along the top and bottom edges of the frame(210); first sprockets(230) fastened to both ends of a connection shaft(234) which is supported at both ends thereof by the connection shaft fastening brackets(216); a drum(240)  
5 supported at both ends thereof by the shaft fastening brackets(215); second sprockets(231) installed on fixed shafts(241) which extend upward and downward from both ends of the drum(240) and connected with the first sprockets(230) by chains(280); the coil spring(260)  
10 installed on the fixed shaft(241) which extends through the second sprocket(231) positioned at an upper end of the drum(240) and fastened at one end thereof to the chain(280) which connects the first and second sprockets(230, 231) with each other; the geared motor(250) connected to the  
15 fixed shaft(241) which extends through the second sprocket(231) positioned at a lower end of the drum(240), to rotate the drum(240); support brackets(220) each having one end which is fastened to a rear side of the transverse pipe(211, 212, 213) and the other end which is provided  
20 with a plurality of rollers(221) brought into contact with the guide rail(110); a sail(270) having one end which is secured to the drum(240) to be wound on the drum(240), upper and lower sides which are connected by connection means(300) to the transverse pipes(211, 212) positioned  
25 along the top and bottom edges of the frame(210) to be guided by the transverse pipes(211, 212), and the other end

which is provided with a fixing rod(271) for connecting the upper and lower sides with each other; and connection wires(290) for connecting the fixing rod(271) with the chains(280), and wherein power supply devices(400) for  
5 supplying power to the geared motor(250) are installed on the power generating means(100, 100').

**【Claim 3】**

The wind turbine according to claim 1, wherein a braking block(710) having a plurality of rollers(711) is  
10 installed under a lower surface of the support plate(700) such that the rollers(711) are brought into rolling contact with a circular rail(610) which is installed on an upper end of the steel tower(600); a driving motor(712) is mounted to the braking block(710); a braking shaft(716)  
15 which is connected to the driving motor(712) by chain gears(713, 714) and a chain(715) is installed on the braking block(710); and a brake lining(717) which is threadedly coupled to the braking shaft(716) is installed on the braking block(710) to be moved forward and rearward  
20 depending upon a rotating direction of the braking shaft(716) to thereby be brought into contact with the circular rail(610).

**【Claim 4】**

The wind turbine according to claim 2, wherein the

connection means(300) comprises wire ropes(310) installed in the transverse pipes(211, 212) and each having one end which is fastened to the drum(240) and the other end which is fastened to a winding pulley(233) positioned coaxial to the first sprocket(230) via a guide pulley(232) installed at a distal end of the transverse pipe(211, 212); a plurality of rings(320) hanging on the wire ropes(310) to be moved along the wire ropes(310) in the transverse pipe; and a plurality of connectors(330) each having one end which is connected to the ring(320) and the other end which projects out of the transverse pipe(211, 212) and is connected with a sail ring(272) provided to the sail(270), whereby the connection means(300) functions to guide the sail(270) along the transverse pipes.

15      **[Claim 5]**

The wind turbine according to claim 2, wherein the connection means comprises a guide block(340) installed on the transverse pipe(211, 212, 213) and defined on a lower or an upper surface thereof with a guide groove(341) which extends in the transverse direction; and a guide member(350) having one end which is fastened to the sail(270) and the other end which has a plurality of projections(351) formed in the shape of zipper teeth and inserted into the guide groove(341).

**【Claim 6】**

The wind turbine according to claim 1, wherein a slack prevention part(111) for preventing slack of the sail structure(200) is integrally formed adjacent to a lower end  
5 of each guide rail(110); and a first support roller(218) which rolls on an upper surface of the slack prevention part(111) and a second support roller(219) which rolls in the guide rail(110) are provided to the sail structure(200).

10 **【Claim 7】**

The wind turbine according to claim 2, wherein the power supply device(400) comprises a power supply rail(410) having a shape which surrounds the power generating means(100, 100'), the power supply rail(410) being  
15 externally supplied with electric power; and a power supply part(430) having a power supply roller(420) which is brought into rolling contact with the power supply rail(410), the power supply part(430) being installed on the sail structure(200) to be moved integrally with the  
20 sail structure(200) and thereby supply power to the sail structure(200).

**【Claim 8】**

The wind turbine according to claim 2, wherein the wind turbine comprises a plurality of limit switches(201)

fastened at regular intervals to the transverse pipe(211) which is positioned along the top edge of the frame(210); a contact block(202) installed on the chain(280) which connects the first and second sprockets with each other, to  
5 be sequentially brought into contact with the limit switches(201) when the sail(270) is wound and unwound and thereby sense an unwound degree of the sail(270); and a control section(900) for receiving switching signals generated from the limit switches(201) to recognize the  
10 unwound degree of the sail(270) and comparing the unwound degree of the sail(270) with a wind pressure which is sensed by wind force sensing means(500) provided with a plurality of limit switches(540, 550) to control the geared motor(250).

15     **[Claim 9]**

The wind turbine according to claim 1, wherein the wind turbine further comprises a wind direction changing plate(1000) installed in front of the two power generating means(100, 100') to change a direction of wind which blows  
20 from a front of the power generating means(100, 100') toward the gap between the two power generating means(100, 100'), toward the sail structures which are positioned outside the power generating means(100, 100').

**[Claim 10]**

The wind turbine according to claim 8, wherein the wind force sensing means(500) comprises at least one rotation fan(510) which has a plurality of wings and is rotated about a rotation shaft(511) by a wind force; a  
5 pump(520) which is connected with the rotation shaft(511) of the rotation fan(510) by a belt(514) and pulleys(512, 513) to pump oil stored in an oil tank(530) using a rotation force of the rotation fan(510); a cylinder(540) formed in the shape of a vertically extending tube which is  
10 filled, from its lower end, with oil supplied from the pump(520), having a piston(541) which is disposed therein to be raised by supplied oil, and connected at its upper end with a drain pipe(542) connected to the oil tank(530); a pressure regulating valve(570) for regulating a pressure  
15 of oil supplied to the cylinder(540) by the pump(520); first and second signal generating blocks(551, 552) connected to the piston(541) by way of a piston rod(543) which is fastened to the piston(541) and a support column(550) which is coupled to the piston rod(543), to be  
20 moved upward and downward integrally with the piston(541); a weight(544) installed on an upper end of the piston rod(543) to apply a predetermined pressure to the piston(541); the plurality of limit switches(581, 582, 583, 591, 592, 593) installed on support bars(560) which are  
25 installed parallel to the support column(550), to generate signals depending upon a position of the first and second



signal generating blocks(551, 552) when the first and second signal generating blocks(551, 552) are moved; and rollers(554) installed on a quadrangular rod(553) which is installed parallel to the support column(550), to guide  
5 upward and downward movement of the first and second signal generating blocks(551, 552).